

HTIRC-02-004



February 9, 2004

To: Commissioner for Patents  
P.O.Box 1450  
Alexandria, VA 22313-1450

Fr: George O. Saile, Reg. No. 19,572  
28 Davis Avenue  
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Subject: | Serial No. 10/718,373 11/20/03 |  
Min Li et al.  
METHOD OF INCREASING CPP GMR IN A  
SPIN VALVE STRUCTURE  
| \_\_\_\_\_ |

INFORMATION DISCLOSURE STATEMENT

Enclosed is Form PTO-1449, Information Disclosure Citation  
In An Application.

The following Patents and/or Publications are submitted to  
comply with the duty of disclosure under CFR 1.97-1.99 and  
37 CFR 1.56.

CERTIFICATE OF MAILING

I hereby certify that this correspondence is being  
deposited with the United States Postal Service as first class  
mail in an envelope addressed to: Commissioner for Patents,  
P.O. Box 1450, Alexandria, VA 22313-1450, on February , 2004.

Stephen B. Ackerman, Reg.# 37761

Signature/Date Stephen B. Ackerman 2/12/04

U.S. Patent 5,627,704 to Lederman et al., "Thin Film Giant Magnetoresistive CPP Transducer with Flux Guide Yoke Structure," discloses a CPP GMR stack structure formed within a gap located in one of two pole layers of a magnetic yoke structure which also has a transducing gap formed in an ABS plane.

U.S. Patent 5,731,937 to Yuan, "Giant Magnetoresistive Transducer with Increased Output Signal," discloses a CPP sensor configuration having sensing element dimensions in a particular ratio to current lead dimensions so that the efficiency of the element is thereby increased.

U.S. Patent 6,219,205 to Yuan et al., "High Density Giant Magnetoresistive Transducer with Recessed Sensor," discloses magnetic transducers employing giant magnetoresistance (GMR) and shielded GMR transducer.

U.S. Patent 5,668,688 to Dykes et al., "Current Perpendicular-to-the-plane Spin Valve Type Magnetoresistive Transducer," discloses a spin valve CPP configuration in which the active layers form a stack of uniform width disposed between upper and lower shield and conductor layers.

U.S. Patent 6,347,022 to Saito, "Spin-valve Type Magnetoresistive Thin Film Element and Spin-valve Type Magnetoresistive Thin Film Head Using the Same," discloses a dual spin-valve configuration in which a magnetically free layer is sandwiched between magnetically pinned layers and which provides an advantageously vertically asymmetric structure and good resistance variations.

U.S. Patent 5,880,912 to Rottmayer, "Magnetic Head with Biased GMR Element and Sense Current Compensation," provides a GMR sensing element having a canted bias field which cancels the adverse affect of the field produced by the applied sensing current and thereby increases the magnitude of the sensing current that can be used.

U.S. Patent 6,317,297 to Tong et al., "Current Pinned Dual Spin Valve with Synthetic Pinned Layers," provides a spin valve configuration with improved linearity and a wider temperature range for thermal stability.

Co-pending U.S. Patent Application HTIRC-02-003, Serial No. 10/392,118, filed 03/19/03, assigned to the same assignee, "GMR Improvement in CPP Valve Head by Inserting a Current Channeling Layer (CCL)," discusses the fabrication of giant magnetoresistive (GMR) magnetic field sensors of a "current-perpendicular-to-the-plane" (CPP) configuration.


Co-pending U.S. Patent Application HTIRC-02-006, Serial No. 10/718,372, filed 11/20/03, assigned to the same assignee, "Self-Alignment Scheme for Enhancement of CPP-GMR," discusses the fabrication of giant magnetoresistive (GMR) magnetic field sensors of a "Current-perpendicular-to-the-plane" (CPP) configuration.

U.S. Patent 6,198,609 to Barr et al., "CPP Magnetoresistive Device with Reduced Edge Effect and Method for Making Same," discusses methods and structures for current-perpendicular-to-plane (CPP) operation of submicron GMR heads.

U.S. Patent 6,205,008 to Gijs et al., "Magnetic-Resistance Device, and Magnetic Head Employing Such a Device," discusses a magneto-resistance device comprising two layers of ferromagnetic material mutually separated by at least one interposed layer of non-ferromagnetic material.

U.S. Patent 6,233,125 to Knapp et al., "CPP Magnetoresistive Device and Method for Making Same," discusses methods and structures for current-perpendicular-to-plane operation of submicron MR heads.

Sincerely,

  
Stephen B. Ackerman,  
Reg. No. 37761

HTIRC-02-004

10/718,373

Applicant

Min Li et al.

Filing Date

11/20/03

Group Art Unit

INFORMATION DISCLOSURE CITATION  
IN AN APPLICATION.

(Use several sheets if necessary)

## U. S. PATENT DOCUMENTS

EXAMINER & TRADEMARK OFFICE	DOCUMENT NUMBER	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
	5627704	5/6/97	Lederman et al.	360	113	2/12/96
	5731937	3/24/98	Yuan	360	113	8/22/97
	6219205	4/17/01	Yuan et al.	360	319	10/10/95
	5668688	9/16/97	Dykes et al.	360	113	5/24/96
	6347022	2/12/02	Saito	360	126	7/22/99
	5880912	3/9/99	Rottmayer	360	113	10/30/97
	6317297	11/13/01	Tong et al.	360	314	10/6/99
	6198609	3/6/01	Barr et al.	360	322	11/9/98
	6205008	3/20/01	Gijs et al.	360	324	5/16/96
	6233125	5/15/01	Knapp et al.	360	317	5/15/00

## FOREIGN PATENT DOCUMENTS

DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUBCLASS	Translation	
					YES	NO

## OTHER DOCUMENTS (Including Author, Title, Date, Portion Pages, Etc.)

-	Co-pending U.S. Patent App. HTIRC-02-003, Serial # 10/392,118, filed 03/19/03, same assignee, "GMR Improvement in CPP Valve Head by Inserting a Current Channeling Layer (CCL)".
-	Co-pending U.S. Patent App. HTIRC-02-006, Serial # 10/718,372, filed 11/20/03, same assignee, "Self-Alignment Scheme for Enhancement of CPP-GMR."

EXAMINER

DATE CONSIDERED

EXAMINER: Initial if citation considered, whether or not citation is in conformance with MPEP § 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to the applicant.